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Multidimensional Decomposition of Poverty:

A Fuzzy Set Approach

Stéphane Mussard

María Noel Pi Alperin

UNIVERSITÉ DE SHERBROOKE

MULTIDIMENSIONAL DECOMPOSITION OF POVERTY:

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Mussard Stéphane[♦]

Pi Alperin María Noel[♣] [♠]

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Abstract: This article extends the paper of Dagum C. and Costa M. ("*Analysis and Measurement of Poverty. Univariate and Multivariate Approaches and their Policy Implications. A case of Study: Italy*", In Dagum C. and Ferrari G. (eds.), Household Behaviour, Equivalence Scales, Welfare and Poverty, Springer Verlag, Germany, 221-271, 2004). We further develop the study of multidimensional poverty using fuzzy sets by introducing a mixture of decomposition analysis. The model yields the most relevant dimensions of poverty (health, education, etc.) and the most relevant sub-groups (areas, gender, etc.) in order to identify the main forces that contribute to the overall amount of the state of poverty. The analysis of these results is useful for decision-makers that contemplate socio-economic policies in favour of poverty reduction. Finally, we apply this decomposition to study the level of poverty of Argentina in 1998.

Key words: Decomposition, Fuzzy Set Theory, Multidimensional Poverty.

JEL Classification: D31, D63, I32

♦ GREDI, Université de Sherbrooke and LAMETA, Université Montpellier I, Av. de la Mer - Site de Richter - C.S. 79606, 34960 Montpellier Cedex 2 France. Tel: 33 (0)4 67 15 84 93 / Fax : 33 (0)4 67 15 84 67. E-mail: s-mussard@lameta.univ-montp1.fr

♣ LAMETA, Université Montpellier I, Av. de la Mer - Site de Richter - C.S. 79606, 34960 Montpellier Cedex 2 France. Tel: 33 (0)4 67 15 84 93 / Fax : 33 (0)4 67 15 84 67. E-mail: pialperin@lameta.univ-montp1.fr

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1. Introduction

The first measures of poverty were introduced by Booth in 1892 and Rowntree in 1901. Since then, several directions of research have been developed with a same characteristic: they consider a single dimension, generally income, occasionally expenditures, as the only variable retained to capture the intensity of poverty. These univariate approaches are not able to incorporate the main dimensions that generate the state of poverty.

During the last three decades, multivariate approaches started to be developed, as the *social exclusion* approach, first introduced by René Lenoir, French Minister of Social Welfare, in 1974; and the *functioning, capability* and *entitlement* approaches introduced by Amartya Sen in 1980. In spite of their qualitative contribution to the multidimensional notion of poverty, these approaches do not propose an operational method to measure the social exclusion.

In 1990, Cerioli and Zani developed a first multidimensional method based on fuzzy set theory, which allows measuring a poverty index including different dimensions (attributes) of poverty. This method was further discussed by Dagum *et al*. (1991), Cheli *et al*. (1994), Martinetti (1994), and Cheli and Lemmi (1995). Dagum and Costa (2004) extended this method introducing a new approach to decompose the poverty index by dimension, and measuring their contribution to the total poverty index.

The aim of this article is to introduce a synthetic decomposition analysis that enables us to identify the dominant aspects, and the most urgent areas of intervention, to provide the basic information for the design and activation of structural socio-economic policies to reduce the intensity of poverty.

This article is organized as follows: *Section 2* presents the basic notions of the multidimensional approach using fuzzy set theory; *Section 3* develops different kinds of decompositions as sub-group decomposition, multi-level sub-group decomposition, attribute decomposition [first introduced by Dagum and Costa (2004)], and multidimensional decomposition. In *Section 4* the multidimensional approach and the decompositions are applied to the analysis and measurement of poverty in Argentina in 1998 using the "Encuesta Permanente de Hogares", that is a permanent survey of households residence. Finally, *Section 5* is devoted to the conclusions.

2. A multidimensional approach using fuzzy sets theory

This section relies on a previous paper of Dagum and Costa (2004) and briefly summarizes the basic concepts related to the multidimensional analysis of poverty in the framework of the fuzzy set theory.

For the application of this method we must define: (*i*) the economic units, the household set in an economic space, $A = \{a_1,..., a_i ,\ldots, a_n\}$; and (*ii*) a *m*-dimension vector of socio-economic attributes to study the level of poverty in A, $X = \{X_1,\ldots, X_j ,\ldots, X_m\}$.

Let B be a fuzzy sub-set of households in A, where $a_i \in B$ stands for the degree of poverty in at least one attribute.

The degree of membership of the *i*-th household ($i = 1,\ldots, n$), with respect to the *j*-th attribute ($j = 1,\ldots, m$), to the fuzzy sub-set *B* is defined as:

$$x_{ij} := \mu_B\left(X_j\left(a_i\right)\right),\ 0 \le x_{ij} \le 1. \tag{1}$$

In particular:

- $x_{ij} = 1$, if the *i*-th household does not possess the *j*-th attribute;
- $x_{ij} = 0$, if the *i*-th household possesses the *j*-th attribute;
- $0 < x_{ij} < 1$, if the *i*-th household possesses the *j*-th attribute with an intensity belonging to the open interval (0,1).

The degree of membership of the *i*-th household to the fuzzy sub-set *B* is defined as a weighted average of x_{ij}:

$$\mu_B\left(a_i\right) = \sum_{j=1}^{m} x_{ij}\, w_j \Big/ \sum_{j=1}^{m} w_j\ . \tag{2}$$

The equation $\mu_B\left(a_i\right)$ measures the poverty index of the *i*-th household, where w_j is the weight attached to the *j*-th attribute. Following this definition, one obtains:

$$0 \le \mu_B\left(a_i\right) \le 1. \tag{3}$$

In particular:

- $\mu_B(a_i) = 0$, if a_i is completely non-poor in the *m* attributes;
- $\mu_B(a_i) = 1$, if a_i is totally poor in the *m* attributes;
- $0 < \mu_B(a_i) < 1$, if a_i is partially or totally deprived in some attributes but not fully deprived in all of them.

As $\mu_B\left(a_i\right)$ measures the degree of poverty of the *i*-th household as a weighted function of the *m* attributes, it also measures the relative deprivation, the degree of social exclusion, and the insufficient capability of the *i*-th household to reach the living standard of the society to which it belongs.

The weight w_j attached to the *j*-th attribute stands for the intensity of deprivation of X_j. It is an inverse function of the degree of deprivation of this attribute by the population of households. The weight proposed by Cerioli and Zani (1990) represents this above property:

$$w_j = \log\left[\sum_{i=1}^{n} g\left(a_i\right) \Big/ \sum_{i=1}^{n} x_{ij}\, g\left(a_i\right)\right], \tag{4}$$

where $g\left(a_i\right) \Big/ \sum_{i=1}^{n} g\left(a_i\right)$ is the relative frequency represented by the sample observation a_i in the total population. The denominator of the logarithm in (4) is always positive. Indeed, if $x_{ij} = 0$, $\forall i$, this would be an irrelevant attribute because there is not any deprivation in X_j.

The fuzzy poverty index of the *A* set is a weighted average of $\mu_B(a_i)$:

$$\mu_B = \sum_{i=1}^{n} \mu_B(a_i) g(a_i) \Big/ \sum_{i=1}^{n} g(a_i). \quad (5)$$

Also, the fuzzy set theory allows one to measure an unidimensional poverty index for each one of the *m* attributes:

$$\mu_B(X_j) = \sum_{i=1}^{n} x_{ij}\, g(a_i) \Big/ \sum_{i=1}^{n} g(a_i). \quad (6)$$

$\mu_B(X_j)$ measures the degree of deprivation of the *j*-th attribute for the entire population of *n* households.

We can also write the fuzzy poverty index as a weighted function of the unidimensional poverty indexes:

$$\mu_B = \sum_{j=1}^{m} \mu_B(X_j) w_j \Big/ \sum_{j=1}^{m} w_j \,. \quad (7)$$

The analysis of the results obtained in (6), for $j = 1,\ldots, m$, enables the policy makers to identify monetary and non monetary aspects of poverty in order to contemplate structural interventions and to raise the poor households to the state of non-poverty.

3. Decompositions of poverty

3.1. Group and sub-group decompositions

A richer way to evaluate the structure of poverty is to provide a decomposition by sub-population groups. Let us divide the total economic surface into *k* groups, S_k, of size n_k ($k = 1,\ldots, s$). The intensity of poverty of the *i*-th household of S_k is given by:

$$\mu_B(a_i^k) = \sum_{j=1}^{m} x_{ij}^k \; w_j \Big/ \sum_{j=1}^{m} w_j \,, \quad (8)$$

where x_{ij}^k is the degree of membership related to the fuzzy sub-set *B* of the *i*-th household of S_k ($i = 1,\ldots, n_k$) with respect to the *j*-th attribute ($j = 1,\ldots, m$). Then, the fuzzy poverty index associated with group S_k is[1]:

$$\mu_B^k = \sum_{i=1}^{n_k} \mu_B(a_i^k) g(a_i^k) \Big/ \sum_{i=1}^{n_k} g(a_i^k). \quad (9)$$

Following (9), the overall fuzzy poverty index can be computed as a weighted average of the poverty level within each group:

[1] $g(a_i^k) \Big/ \sum_{i=1}^{n_k} g(a_i^k)$ is the relative frequency represented by the sample observation a_i^k of S_k.

$$\mu_B = \sum_{k=1}^{s}\sum_{i=1}^{n_k} \mu_B\left(a_i^k\right) g\left(a_i^k\right) \Big/ \sum_{i=1}^{n} g\left(a_i\right). \tag{10}$$

Hence, it is possible to measure the contribution of the *k*-th group to the global index of poverty:

$$C_{\mu_B}^{k} = \sum_{i=1}^{n_k} \mu_B\left(a_i^k\right) g\left(a_i^k\right) \Big/ \sum_{i=1}^{n} g\left(a_i\right). \tag{11}$$

This yields another possibility to decision makers to reduce the overall poverty in focusing on the poorest groups (region, educational group, etc.).

Now, let us divide each one of the *k* groups, S_k, (k = 1,…, *s*), into *b* sub-groups S_{bk} (b = 1,…, *p*) of size n_{bk}. The intensity of poverty of the *i*-th household of sub-group S_{bk} is:

$$\mu_B\left(a_i^{bk}\right) = \sum_{j=1}^{m} x_{ij}^{bk}\ w_j \Big/ \sum_{j=1}^{m} w_j\ , \tag{12}$$

where x_{ij}^{kb} is the degree of membership related to the fuzzy sub-set *B* of the *i*-th household of S_{bk} (i = 1,…, n_{bk}) with respect of the *j*-th attribute (j = 1,…, *m*). Thus, we can measure the state of poverty within each sub-group[2]:

$$\mu_B^{bk} = \sum_{i=1}^{n_{bk}} \mu_B\left(a_i^{bk}\right) g\left(a_i^{bk}\right) \Big/ \sum_{i=1}^{n_{bk}} g\left(a_i^{bk}\right). \tag{13}$$

Also, it is possible to calculate the contribution of the *b*-th sub-group to the *k*-th group's multidimensional poverty index:

$$C_{\mu_B^k}^{bk} = \sum_{i=1}^{n_{bk}} \mu_B\left(a_i^{bk}\right) g\left(a_i^{bk}\right) \Big/ \sum_{i=1}^{n_k} g\left(a_i^{k}\right). \tag{14}$$

Hence, the overall fuzzy poverty index can be defined as a weighted average of the poverty intensity that exists within the groups of the second partition:

$$\mu_B = \sum_{b=1}^{p}\sum_{k=1}^{s}\sum_{i=1}^{n_{bk}} \mu_B\left(a_i^{bk}\right) g\left(a_i^{bk}\right) \Big/ \sum_{i=1}^{n} g\left(a_i\right). \tag{15}$$

Consequently, the contribution to the global poverty index of the *b*-th sub-group of the *k*-th group is:

$$C_{\mu_B}^{bk} = \sum_{i=1}^{n_{bk}} \mu_B\left(a_i^{bk}\right) g\left(a_i^{bk}\right) \Big/ \sum_{i=1}^{n} g\left(a_i\right). \tag{16}$$

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[2] $g\left(a_i^{bk}\right) \Big/ \sum_{i1=}^{n_{bk}} g\left(a_i^{bk}\right)$ is the relative frequency represented by the sample observation a_i^{bk} of S_{bk}.

This multi-level decomposition allows us to compute precisely the sub-group determinants (gender, educational group, age group, region, etc.) that contribute to amplify the global poverty.

3.2. Decomposition by attribute: Dagum and Costa (2004)

Dagum and Costa (2004) introduced the decomposition by attribute showing that it is possible to gauge the contribution of the *j*-th attribute to the overall amount of poverty. From the unidimensional fuzzy poverty indexes (6) and from the weights connected with each attribute (4), the authors obtain the (absolute) contribution of the *j*-th attribute to the multidimensional poverty index:

$$C_{\mu_B}^{j} = \mu_B\left(X_j\right) w_j \Big/ \sum_{j=1}^{m} w_j \,. \tag{17}$$

According to (17), it is possible to calculate the contribution of the *j*-th attribute to the *k*-th group, and the contribution of the *j*-th attribute to the *b*-th sub-group.
Firstly, we introduce the unidimensional poverty index of the *j*-th attribute for the *k*-th group:

$$\mu_B\left(X_j^{\,k}\right) = \sum_{i=1}^{n_k} x_{ij}^{k}\, g\left(a_i^{k}\right) \Big/ \sum_{i=1}^{n_k} g\left(a_i^{k}\right). \tag{18}$$

Using (18) we estimate the contribution of the *j*-th attribute to the *k*-th group:

$$C_{\mu_B^k}^{j} = \mu_B\left(X_j^{\,k}\right) w_j \Big/ \sum_{j=1}^{m} w_j \,. \tag{19}$$

Secondly, we define the unidimensional poverty index of the *j*-th attribute in S_{bk} :

$$\mu_B\left(X_j^{\,bk}\right) = \sum_{i=1}^{n_{kb}} x_{ij}^{bk}\, g\left(a_i^{bk}\right) \Big/ \sum_{i=1}^{n_{kb}} g\left(a_i^{bk}\right). \tag{20}$$

This gives the contribution of the *j*-th attribute to the *b*-th sub-group poverty index:

$$C_{\mu_B^{bk}}^{j} = \mu_B\left(X_j^{\,bk}\right) w_j \Big/ \sum_{j=1}^{m} w_j \,. \tag{21}$$

Contrary to the group and sub-group decompositions, the attribute decomposition allows decision makers to obtain more information about different characteristics of poverty. Therefore, this yields more precision for the design and the activation of an appropriate structural socio-economic policy to alleviate the state of poverty.

3.3. Multidimensional decomposition

This section is devoted to the multidimensional analysis of the decomposition structure of the fuzzy index of poverty μ_B. In 1998, Chakravarty, Mukherjee and Ranade introduced a class of

poverty indexes simultaneously decomposable by attribute and by sub-group. We demonstrate that the fuzzy index of poverty satisfies this property.

Following (18), we define the fuzzy poverty index as a weighted function of the unidimensional poverty index of the *j*-th attribute in the *k*-th group:

$$\mu_B = \sum_{k=1}^{s}\sum_{j=1}^{m} \mu_B\left(X_j^k\right) w_j \Big/ \sum_{j=1}^{m} w_j \ . \tag{22}$$

Thus, it is possible to gauge the contribution of the *j*-th attribute of the *k*-th group to the global index of poverty:

$$C_{\mu_B}^{jk} = \mu_B\left(X_j^k\right) w_j \Big/ \sum_{j=1}^{m} w_j \ . \tag{23}$$

This combined decomposition provides all the couples "attribute/group" that contribute to the overall amount of poverty. If two partitions of groups are taken into account, and if we consider the unidimensional poverty index of the *j*-th attribute in S_{bk} (20), the multidimensional poverty index for the entire economic surface is:

$$\mu_B = \sum_{k=1}^{s}\sum_{b=1}^{p}\sum_{j=1}^{m} \mu_B\left(X_j^{bk}\right) w_j \Big/ \sum_{j=1}^{m} w_j \ . \tag{24}$$

Therefore, we measure the contribution of the pairs "sub-group/attribute" to μ_B:

$$C_{\mu_B}^{jbk} = \mu_B\left(X_j^{bk}\right) w_j \Big/ \sum_{j=1}^{m} w_j \ . \tag{25}$$

As we mention above, these decompositions give precious information to reduce the intensity of poverty.

4. A Case of Study: Argentina

This study deals with the multidimensional measurement of poverty using fuzzy set theory and its decomposition possibilities. The methods are applied to Argentina. The application covers 28,511 households for each one of Argentina's provinces in May 1998. The data base used in this study comes from the "Encuesta Permanente de Hogares (EPH)" that is a permanent survey of households residences. This multidimensional survey has been performed every year since 1974 by the INDEC (Argentina Institute of Statistics and Census). This survey includes information about income, labor, market characteristics, demographic characteristics, housing, education and training.

4.1. The socio-economic attributes selected to study the state of poverty

The two principal criteria that help the selection of the socio-economic attributes are: the multidimensional approach of poverty and the information provided by the EPH. This choice

is very important because each attribute represents a degree of deprivation and social exclusion of the studied households. As Dagum and Costa (2004) said:

"[W]hen *the more precise are the m chosen attributes to portray the state of poverty, the more accurate is the available statistical information, and the more rigorous and relevant becomes the statistico-mathematical method to translate them into an encompassing poverty ratio. Hence, the more useful this ratio will be to assess the state of poverty, to identify its main causes, and to inspire a sound structural socioeconomic policy to abate the causes of poverty.*"

The selected attributes are:

- occupancy title and location of the household residence (X_1);
- materials of construction of the household (X_2);
- household size (X_3);
- toilet characteristics (X_4);
- flowing characteristics (X_5);
- household equivalent income[3] (X_6);
- higher level of education completed by the reference person (X_7);
- stability of occupation of the reference person (X_8);
- professional occupation of the reference person (X_9);
- social contributions (X_{10});
- ratio: number of the household members with income and the household size (X_{11}).

In the following sections, we expose the principal ideas resulting from the application of the three decomposition methodologies[4].

4.2. The standard decomposition

We apply Dagum and Costa's (2004) attribute decomposition. The multidimensional poverty index (MPI) for Argentina in 1998 is μ_B = 0.1638, that means that 16.38% of Argentina's households are structurally poor. We have estimated the unidimensional poverty indexes by attribute to identify the main characteristics of the poor households. Among these 11 attributes, the social contributions (X_{10}) emerge as the most affected dimension of poverty. It is followed by the level of education (X_7). In the third and forth places, we find the professional occupation (X_9) and the household equivalent income (X_6), respectively (see *Table 1*).

It is also possible to measure the contribution of each dimension to the global poverty. Five main aspects of social exclusion exhibit the highest contributions to μ_B: the household equivalent income, followed by the professional occupation, the stability of occupation, the flowing characteristics and the occupancy title of the household residence.

Even if these results give us enough information to identify the features of poverty, the decomposition analysis offers different ways to explain precisely the complex structure of the overall poverty phenomenon.

[3] Divided by the corresponding value of the equivalent scale. See Dagum and Costa (2004) for more details of this method. And Table A.II.1, in Appendix II, for the values of the equivalents scales used in this study.
[4] Appendix A.I presents the degree of membership of the socio-economic attributes.

Table 1: UPI[5] by attribute for the entire country, and absolute and relative contributions to μ_B

Attributes	$\mu_B(X_j)$	Absolute contributions	Relative contributions
Occupancy title of the household residence	0.1741	0.0167	**10.2064**
Materials of construction	0.0199	0.0043	2.6176
Household size	0.0838	0.0114	6.9684
Toilets characteristics	0.0888	0.0112	6.8158
Flowing characteristics	0.1792	0.0169	**10.3313**
Household equivalent income	**0.4225**	0.0200	**12.2065**
Level of education	**0.6165**	0.0164	9.9996
Stability of occupation	**0.2251**	0.0184	**11.2554**
Professional occupation	**0.4818**	0.0193	**11.7980**
Social contributions	**0.7031**	0.0136	8.3050
Members with income/household size	0.1485	0.0156	9.4960
Total	**16.38%**	**0.1638**	**100%**

4.3. The multidimensional decomposition

The implemented group decompositions are: (*i*) the six principal regions of Argentina; (*ii*) the civil status of the reference person; (*iii*) the gender of the reference person; and finally, (*iv*) the household size.

Table 2: MPI by different decompositions, and their absolute and relative contributions to μ_B

Decompositions		μ_B^k	Absolute contributions	Relative contributions
Regions	**Cuyo**	0.1790	0.0105	6.4324
	Great Buenos Aires	0.1583	0.0889	**54.2543**
	North-east	**0.1792**	0.0076	4.6173
	North-west	0.1734	0.0132	8.0446
	Pampeana	0.1697	0.0402	**24.5163**
	Patagonia	0.1414	0.0035	2.1350
Civil status	**Single**	0.1668	0.0179	10.9026
	Common law	**0.2179**	0.0252	15.3543
	Married	0.1449	0.0787	**48.0117**
	Divorced	0.1709	0.0156	9.5215
	Widower	0.1853	0.0266	16.2099
Gender	**Men**	0.1574	0.1153	**70.3835**
	Women	**0.1814**	0.0485	29.6165
Household size	**1-2**	**0.2080**	0.0747	**45.6184**
	3-4	0.1411	0.0780	**47.6205**
	5-6	0.1214	0.0091	5.5584
	7 or more	0.1550	0.0020	1.2026

First, let us analyze the group decompositions. *Table 2* underlines two kinds of information: (*i*) the multidimensional poverty indexes for each one of the groups after decompositions; and (*ii*) their absolute and relative contributions to the MPI. For instance, the decomposition by region shows that the North-east is the poorest one with 17.98% of structurally poor households. Nevertheless, the study of the group contributions shows that 78.80% of the intensity of poverty is explained by the Great Buenos Aires and Pampeana regions. This result is plausible since the relative contribution involves the number of persons in each group. This information is very important because even if the North-east is the poorest region, the

[5] UPI: Unidimensional Poverty Index.

elimination of poverty in this economic surface will only reduce 4.62% (relative contribution level) of Argentina's poverty[6].

For the decomposition by civil status, people in common law are the most affected by poverty, but the biggest contribution is attributed to married people that represent almost 50 % of the poor households. The gender decomposition shows that women are more affected than men, but the most important contribution is concerned with men, usually recognized as the household reference person. Finally, the household size decomposition points out smallest houses (1 and 2 bedrooms) as the most affected group by the state of poverty. Adding their contribution with those of households with 3 or 4 bedrooms gives almost 95% of the global poverty.

Table 3: UPI by attribute and by region

	Attributes										
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
Cuyo	0.2221	0.1280	0.0938	0.0279	0.1463	0.4576	0.6227	0.2037	0.4488	0.7191	0.1229
GBA	0.1569	0.0097	0.0673	0.0888	0.1990	0.3828	0.6174	0.2243	0.4775	0.6925	0.1475
NE	0.2082	0.0285	0.1345	0.1086	0.1268	0.5685	0.6353	0.2075	0.4618	0.6898	0.1441
NW	0.1861	0.0174	0.1415	0.1015	0.1177	0.4849	0.6254	0.2428	0.4899	0.7355	0.1287
Pamp.	0.1906	0.0126	0.0921	0.0654	0.1821	0.4747	0.6068	0.2332	0.5081	0.7275	0.1695
Patag.	0.1997	0.0581	0.0927	0.0500	0.0597	0.2983	0.6158	0.1894	0.4141	0.5955	0.0996

Let us now apply the multidimensional decomposition. In *Tables 3* and *5*, we find the unidimensional poverty indexes by attribute and by: (*i*) region, and (*ii*) civil status, respectively. These values, reflecting a bidimensional degree of deprivation, are different. Then, we distinguish different characteristics of poverty in each group. Contrary to the standard attribute decomposition, this means that the level of equivalent income (X_6) is not necessary the most explicative attribute to understand the problem of poverty in each group[7].

Table 4: Absolute and relative contributions to μ_B by attribute and by region

	Attributes										
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
Cuyo	0.0013	0.0016	0.0008	0.0002	0.0008	0.0013	0.0010	0.0010	0.0011	0.0008	0.0008
	(0.77)	(0.99)	(0.46)	(0.14)	(0.50)	(0.78)	(0.59)	(0.60)	(0.65)	(0.50)	(0.46)
GBA	**0.0085**	0.0012	**0.0051**	**0.0069**	**0.0106**	**0.0102**	**0.0092**	**0.0103**	**0.0108**	**0.0075**	**0.0087**
	(5.16)	(0.72)	**(3.14)**	**(4.21)**	**(6.44)**	**(6.21)**	**(5.62)**	**(6.30)**	**(6.57)**	**(4.59)**	**(5.30)**
NE	0.0008	0.0003	0.0008	0.0006	0.0005	0.0011	0.0007	0.0007	0.0008	0.0006	0.0006
	(0.52)	(0.16)	(0.47)	(0.39)	(0.31)	(0.69)	(0.44)	(0.44)	(0.48)	(0.34)	(0.39)
NW	0.0014	0.0003	0.0015	0.0011	0.0008	0.0017	0.0013	0.0015	0.0015	0.0011	0.0010
	(0.83)	(0.17)	(0.89)	(0.67)	(0.52)	(1.06)	(0.77)	(0.92)	(0.91)	(0.66)	(0.63)
Pamp.	0.0043	0.0006	0.0030	0.0021	0.0041	0.0053	0.0038	0.0045	0.0048	0.0033	0.0042
	(2.64)	(0.39)	(1.81)	(1.31)	(2.48)	(3.25)	(2.33)	(2.76)	(2.94)	(2.03)	(2.56)
Patag.	0.0005	0.0003	0.0003	0.0002	0.0001	0.0003	0.0004	0.0004	0.0004	0.0003	0.0003
	(0.29)	(0.19)	(0.19)	(0.10)	(0.09)	(0.21)	(0.25)	(0.23)	(0.25)	(0.17)	(0.16)

Tables 4 and *6* expose the absolute and relative contributions to the multidimensional poverty index by attribute and by: (*i*) region; and (*ii*) civil status, respectively. Row GBA (see *Table 4*) shows the couples "attribute/group" that have the most important contribution to μ_B explaining 25% of the multidimensional poverty index. Even if the marginal decompositions indicate that household equivalent income and GBA region yield the highest contributions (12.21% and 54.24% of the global poverty, respectively), the combination "equivalent

[6] Appendix III presents more details of the distribution of the population in Argentina.
[7] In Appendix IV we find the multidimensional decomposition by gender and by household size.

income/GBA" do not necessarily produces the most important contribution. It contributes with a 6.21% to the overall poverty, whereas 6.57% of the MPI is explained by the "professional occupation/GBA" pair.

Table 5: UPI by attribute and by civil status

	Attributes										
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
Single	0.2646	0.0253	0.0299	0.0876	0.1352	0.4637	0.4471	0.2617	0.5262	0.7271	0.1583
C. law	0.3037	0.0398	0.2411	0.1876	0.2671	0.4961	0.7258	0.1956	0.3558	0.6809	0.0947
Mar.	0.1328	0.0160	0.0793	0.0614	0.1741	0.3633	0.5831	0.1842	0.4109	0.6432	0.1550
Div.	0.2309	0.0195	0.0685	0.0971	0.1874	0.4532	0.5833	0.2724	0.4500	0.6836	0.1289
Widow.	0.1229	0.0149	0.0242	0.0525	0.1555	0.5371	0.8028	0.3460	0.8386	0.9426	0.1723

Table 6: Absolute and relative contributions to μ_B by attribute and by civil status

	Attributes										
	X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
Single	0.0027	0.0006	0.0004	0.0013	0.0014	0.0024	0.0013	0.0023	0.0023	0.0015	0.0018
	(1.66)	(0.36)	(0.27)	(0.79)	(0.83)	(1.43)	(0.78)	(1.40)	(1.38)	(0.92)	(1.08)
Common law	**0.0034**	0.0010	**0.0038**	0.0030	0.0029	0.0027	0.0022	0.0018	0.0016	0.0015	0.0011
	(2.06)	(0.60)	**(2.31)**	(1.83)	(1.78)	(1.65)	(1.36)	(1.13)	(1.01)	(0.93)	(0.70)
Mar.	**0.0069**	0.0019	**0.0059**	**0.0046**	**0.0089**	**0.0093**	**0.0084**	**0.0082**	**0.0089**	**0.0068**	**0.0088**
	(4.22)	(1.14)	**(3.58)**	**(2.81)**	**(5.45)**	**(5.70)**	**(5.13)**	**(5.00)**	**(5.46)**	**(4.12)**	**(5.38)**
Div.	0.0020	**0.0004**	0.0009	0.0012	0.0016	0.0020	0.0014	0.0020	0.0016	0.0012	0.0012
	(1.24)	**(0.23)**	(0.52)	(0.75)	(0.99)	(1.20)	(0.86)	(1.24)	(1.01)	(0.74)	(0.75)
Widow.	0.0017	0.0005	0.0005	0.0010	0.0021	0.0036	0.0031	0.0041	0.0048	0.0026	0.0026
	(1.03)	(0.28)	(0.29)	(0.64)	(1.29)	(2.22)	(1.87)	(2.48)	(2.93)	(1.60)	(1.58)

Finally, the couples "attribute/married reference persons" (see *Table 6*) explain almost 46.85% of the global poverty. On the other hand, the least important couple is "materials of construction of households/divorced reference person" with a 0.23% of μ_B.

4.4. The multi-level and the multidimensional decompositions

Table 7: MPI by gender of regions, their absolute and relative contributions to μ_B and the relative contribution to the k-th group of the b-th sub-group

Groups: Regions	**Sub-groups: Gender**	μ_B^{kb}	**Relative contribution to the *k*-th group of the *b*-th sub-group**	**Absolute contribution to μ_B of the *b*-th sub-group**	**Relative contribution to μ_B of the *b*-th sub-group**
Cuyo	**Men**	0.1732	**73.16**	0.0077	4.71
	Women	**0.1971**	26.84	0.0028	1.73
GBA	**Men**	0.1513	**69.97**	0.0622	**37.96**
	Women	**0.1775**	30.03	0.0267	**16.30**
North-east	**Men**	0.1728	**72.00**	0.0054	3.32
	Women	**0.1979**	28.00	0.0021	1.29
North-west	**Men**	0.1687	**69.18**	0.0091	5.57
	Women	**0.1848**	30.82	0.0041	2.48
Pampeana	**Men**	0.1638	**70.22**	0.0282	**17.22**
	Women	**0.1856**	29.78	0.0120	7.30
Patagonia	**Men**	0.1382	**75.53**	0.0026	1.61
	Women	**0.1525**	24.47	0.0009	0.52
Total		**0.1638**		**0.1638**	**100%**

We first investigate the multi-level decomposition by region and by gender (see *Table 7*). On the one hand, the female sub-groups are the poorest ones in all regions. They have the highest poverty indexes. On the other hand, the men sub-groups have the most important relative contributions to the multidimensional poverty indexes of each region, their values are quite similar with a variation between 69.18% and 75.53%.

Other sub-group determinants are important. The sub-groups of Great Buenos Aires's region and the male sub-group of Pampena's region have the most important contribution explaining 71.48% of the global multidimensional poverty in Argentina.

Table 8: UPI by attribute and by gender of each region

		Attributes										
		X_1	**X_2**	**X_3**	**X_4**	**X_5**	X_6	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
1	**M**	0.2351	0.1295	0.1090	0.0280	0.1527	0.4305	0.6070	0.1604	0.3625	0.6743	0.1184
	W	0.1817	0.1236	0.0469	0.0277	0.1265	0.5419	0.6716	0.3382	0.7164	0.8580	0.1367
2	**M**	0.1519	0.0101	0.0754	0.0931	0.2048	0.3498	0.6015	0.1920	0.4087	0.6484	0.1414
	W	0.1705	0.0087	0.0451	0.0770	0.1829	0.4731	0.6608	0.3127	0.6654	0.8130	0.1641
3	**M**	0.2028	0.0288	0.1475	0.1111	0.1288	0.5490	0.6309	0.1645	0.3968	0.6487	0.1417
	W	0.2238	0.0276	0.0964	0.1010	0.1209	0.6258	0.6479	0.3342	0.6532	0.8106	0.1510
4	**M**	0.1891	0.0172	0.1607	0.1151	0.1263	0.4619	0.6081	0.1976	0.4164	0.6900	0.1228
	W	0.1787	0.0178	0.0944	0.0807	0.0965	0.5413	0.6679	0.3540	0.6707	0.8473	0.1434
5	**M**	0.1880	0.0140	0.1028	0.0684	0.1921	0.4427	0.5917	0.1924	0.4284	0.6869	0.1739
	W	0.1974	0.0091	0.0637	0.0574	0.1556	0.5602	0.6471	0.3425	0.7211	0.8361	0.1575
6	**M**	0.2042	0.0601	0.1044	0.0549	0.0639	0.2653	0.6124	0.1551	0.3669	0.5612	0.1018
	W	0.1845	0.0512	0.0527	0.0333	0.0457	0.4106	0.6277	0.3061	0.5749	0.7125	0.0922

Note: 1: Cuyo; 2:GBA; 3: North-east; 4: North-west; 5: Pampeana; and 6: Patagonia. M: Men; and W: Women.

Table 9: Absolute and relative contributions to μ_B by attribute and by gender of each region

		Attributes										
		X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
1	**M**	0.0010	0.0012	0.0007	0.0002	0.0006	0.0009	0.0007	0.0006	0.0006	0.0006	0.0006
		(0.61)	(0.76)	(0.40)	(0.11)	(0.39)	(0.55)	(0.44)	(0.36)	(0.40)	(0.35)	(0.34)
	W	0.0003	0.0004	0.0001	0.0001	0.0002	0.0004	0.0003	0.0004	0.0004	0.0002	0.0002
		(0.15)	(0.23)	(0.06)	(0.03)	(0.10)	(0.22)	(0.16)	(0.24)	(0.25)	(0.15)	(0.13)
2	**M**	**0.0060**	0.0009	0.0042	**0.0053**	**0.0080**	**0.0068**	**0.0066**	**0.0065**	**0.0067**	**0.0052**	**0.0061**
		(3.66)	(0.54)	(2.58)	**(3.23)**	**(4.85)**	**(4.16)**	**(4.01)**	**(3.95)**	**(4.12)**	**(3.15)**	**(3.72)**
	W	0.0025	0.0003	0.0009	0.0016	0.0026	0.0034	0.0026	0.0039	0.0040	0.0024	0.0026
		(1.50)	(0.17)	(0.56)	(0.98)	(1.59)	(2.06)	(1.61)	(2.35)	(2.45)	(1.44)	(1.58)
3	**M**	0.0006	0.0002	0.0006	0.0005	0.0004	0.0008	0.0005	0.0004	0.0005	0.0004	0.0005
		(0.37)	(0.12)	(0.39)	(0.30)	(0.23)	(0.50)	(0.32)	(0.26)	(0.31)	(0.24)	(0.29)
	W	0.0002	0.0001	0.0001	0.0001	0.0001	0.0003	0.0002	0.0003	0.0003	0.0002	0.0002
		(0.14)	(0.04)	(0.09)	(0.09)	(0.07)	(0.19)	(0.11)	(0.18)	(0.17)	(0.10)	(0.10)
4	**M**	0.0010	0.0002	0.0012	0.0009	0.0006	0.0012	0.0009	0.0009	0.0009	0.0007	0.0007
		(0.60)	(0.12)	(0.72)	(0.52)	(0.39)	(0.72)	(0.53)	(0.53)	(0.55)	(0.44)	(0.42)
	W	0.0004	0.0001	0.0003	0.0002	0.0002	0.0006	0.0004	0.0006	0.0006	0.0004	0.0003
		(0.23)	(0.05)	(0.17)	(0.15)	(0.12)	(0.34)	(0.24)	(0.39)	(0.36)	(0.22)	(0.20)
5	**M**	0.0031	0.0005	0.0024	0.0016	0.0031	0.0036	0.0027	0.0027	0.0030	0.0023	0.0031
		(1.90)	(0.32)	(1.47)	(0.99)	(1.91)	(2.20)	(1.65)	(1.66)	(1.81)	(1.40)	(1.92)
	W	0.0012	0.0001	0.0006	0.0005	0.0009	0.0017	0.0011	0.0018	0.0019	0.0010	0.0011
		(0.75)	(0.08)	(0.34)	(0.31)	(0.58)	(1.04)	(0.68)	(1.10)	(1.14)	(0.64)	(0.65)
6	**M**	0.0004	0.0002	0.0003	0.0001	0.0001	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002
		(0.23)	(0.15)	(0.17)	(0.09)	(0.07)	(0.15)	(0.19)	(0.15)	(0.17)	(0.13)	(0.12)
	W	0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
		(0.06)	(0.04)	(0.02)	(0.02)	(0.01)	(0.07)	(0.06)	(0.09)	(0.08)	(0.05)	(0.03)

Note: 1: Cuyo; 2:GBA; 3: North-east; 4: North-west; 5: Pampeana; and 6: Patagonia. M: Men; and W: Women.

Let us now analyze the multidimensional decomposition of this multi-level decomposition. The values of the UPI by attribute and by gender of each region (see *Tables 8*) are not necessary the same for each sub-group. However, the level of education of the reference person, the level of equivalent disposable income, the social contributions and the professional occupation are the four main dimensions of social exclusion in all sub-groups.

Table 3 and *Table 8* exhibit the importance of the sub-group decomposition. For example, the UPI values for the income attribute (X_6) in all regions (*Table 3*) are included between 0.2983 and 0.5685. Concerning the gender decomposition and X_6, these UPI values are included between 0.2653 and 0.5490 for the male sub-groups, and between 0.4106 and 0.6258 for the female sub-groups (*Table 8*). The other dimensions show that men and women are concerned with different exclusion characteristics showing that socio-economic policies should have not to be necessary the same for each sub-group.

Dealing with the contributions to the multidimensional poverty index indicates that, excepted X_2 and X_3, all the attributes of the male group in Great Buenos provide the major contributions to μ_B (see *Table 9*). Specially, the "flowing characteristics/men-GBA" couple which explains 4.85% of the state of poverty in Argentina.[8]

Table 10: MPI by gender of civil status, their absolute and relative contributions to μ_B and the relative contribution to the k-th group of the b-th sub-group

Groups: Civil Status	Sub-groups: Gender	μ_B^{kb}	Relative contribution to the *k*-th group of the *b*-th sub-group	Absolute contribution to μ_B of the *b*-th sub-group	Relative contribution to μ_B of the *b*-th sub-group
Single	**Men**	**0.1683**	46.52	0.0083	5.07
	Women	0.1655	**53.48**	0.0096	5.83
Common law	**Men**	0.2171	**89.88**	0.0226	**13.80**
	Women	**0.2254**	10.12	0.0025	1.55
Married	**Men**	0.1435	**96.43**	0.0758	**46.30**
	Women	**0.1965**	3.56	0.0028	1.71
Divorced	**Men**	0.1678	27.38	0.0043	2.61
	Women	**0.1721**	**72.62**	0.0113	6.91
Widower	**Men**	0.1711	16.07	0.0043	2.60
	Women	**0.1883**	**83.93**	0.0223	**13.61**
Total		**0.1638**		**0.1638**	**100%**

The second multi-level decomposition deals with gender and civil status. *Table 10* reveals that only in single group, female sub-group is not the most affected by poverty, which is the case in the other groups. Considering the relative contribution to each civil status group of each sub-group, in cases where the reference person is living in couple, as in common law or married, the men sub-group has the most important contribution to the poverty in each one of these groups explaining 89.88% in the first case and 96.43% in the second case. However, when the reference person is not living in couple (single, divorced or widower), the women sub-group is the most contributive with a 53.48%, 72.62%, and a 83.93% to the poverty level of the single, divorced and widower group, respectively.

[8] In Appendix V we find the results for others multi-level and multidimensional decompositions by: (*i*) household size of regions; and (*ii*) years old of gender.

Table 11: UPI by attribute and by gender of civil status

		Attributes										
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
S	**M**	0.2835	0.0348	0.0075	0.1004	0.1625	0.4491	0.4580	0.2396	0.4804	0.7231	0.1628
	W	0.2477	0.0172	0.0491	0.0767	0.1119	0.4762	0.4378	0.2805	0.5653	0.7305	0.1544
C	**M**	0.3082	0.0417	0.2451	0.1941	0.2701	0.4987	0.7205	0.1759	0.3271	0.6703	0.0911
	W	0.2630	0.0225	0.2039	0.1280	0.2395	0.4722	0.7747	0.3766	0.6213	0.7778	0.1285
M	**M**	0.1317	0.0156	0.0791	0.0613	0.1739	0.3600	0.5822	0.1789	0.4058	0.6387	0.1528
	W	0.1732	0.0323	0.0894	0.0649	0.1797	0.4826	0.6139	0.3812	0.5996	0.8086	0.2360
D	**M**	0.2907	0.0231	0.0248	0.1194	0.1868	0.4160	0.6290	0.2227	0.3654	0.6889	0.1407
	W	0.2077	0.0181	0.0855	0.0884	0.1877	0.4675	0.5657	0.2917	0.4826	0.6816	0.1243
W	**M**	0.1086	0.0162	0.0217	0.0573	0.1342	0.4624	0.7705	0.3066	0.7367	0.9093	0.1813
	W	0.1260	0.0147	0.0247	0.0515	0.1600	0.5529	0.8096	0.3543	0.8601	0.9496	0.1704

Note: Civil Status, S: single; C: common law couple; M: married; D: divorced; and W: widower.

The UPI indexes by attribute and by gender of each civil status are presented in *Table 11*. On the one hand, single women and divorced women are less affected by educational problems than men. On the other hand, men sub-groups have more stability in their occupations than women. So, it is possible to conclude that women sub-groups are not necessary more affected than men in all dimensions, as shown previously with the MPI by gender of civil status in *Table 10*.

Table 12: Absolute and relative contributions to μ_B by attribute and by gender of each civil status

		Attributes										
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
S	**M**	0.0013	0.0004	0.0001	0.0007	0.0008	0.0010	0.0006	0.0010	0.0010	0.0007	0.0008
		(0.82)	(0.23)	(0.03)	(0.42)	(0.46)	(0.64)	(0.37)	(0.59)	(0.58)	(0.42)	(0.51)
	W	0.0014	0.0002	0.0004	0.0006	0.0006	0.0013	0.0007	0.0013	0.0013	0.0008	0.0009
		(0.84)	(0.13)	(0.24)	(0.37)	(0.37)	(0.79)	(0.41)	(0.81)	(0.80)	(0.50)	(0.57)
C	**M**	0.0031	0.0009	0.0035	0.0028	0.0027	0.0025	0.0020	0.0015	0.0014	0.0014	0.0010
		(1.88)	(0.57)	(2.12)	(1.71)	(1.62)	(1.50)	(1.22)	(0.92)	(0.83)	(0.82)	(0.61)
	W	0.0003	0.0001	0.0003	0.0002	0.0003	0.0003	0.0002	0.0003	0.0003	0.0002	0.0002
		(0.17)	(0.03)	(0.19)	(0.12)	(0.16)	(0.15)	(0.14)	(0.21)	(0.17)	(0.10)	(0.09)
M	**M**	**0.0067**	0.0018	**0.0057**	0.0045	**0.0087**	**0.0090**	**0.0082**	**0.0077**	**0.0086**	**0.0065**	**0.0085**
		(4.08)	(1.08)	**(3.47)**	(2.74)	**(5.30)**	**(5.50)**	**(4.99)**	**(4.73)**	**(5.25)**	**(3.99)**	**(5.17)**
	W	0.0002	0.0001	0.0002	0.0001	0.0002	0.0003	0.0002	0.0004	0.0003	0.0002	0.0004
		(0.14)	(0.06)	(0.11)	(0.08)	(0.15)	(0.20)	(0.14)	(0.27)	(0.21)	(0.14)	(0.22)
D	**M**	0.0007	0.0001	0.0001	0.0004	0.0004	0.0005	0.0004	0.0005	0.0004	0.0003	0.0004
		(0.43)	(0.08)	(0.05)	(0.26)	(0.27)	(0.31)	(0.26)	(0.28)	(0.23)	(0.21)	(0.23)
	W	0.0013	0.0003	0.0008	0.0008	0.0012	0.0015	0.0010	0.0016	0.0013	0.0009	0.0009
		(0.80)	(0.16)	(0.47)	(0.49)	(0.71)	(0.89)	(0.60)	(0.96)	(0.78)	(0.53)	(0.52)
W	**M**	0.0003	0.0001	0.0001	0.0002	0.0003	0.0005	0.0005	0.0006	0.0007	0.0004	0.0005
		(0.16)	(0.05)	(0.05)	(0.12)	(0.19)	(0.33)	(0.31)	(0.38)	(0.45)	(0.27)	(0.29)
	W	0.0014	0.0004	0.0004	0.0008	0.0018	0.0031	0.0025	0.0034	0.0041	0.0022	0.0021
		(0.87)	(0.23)	(0.24)	(0.51)	(1.09)	(1.89)	(1.55)	(2.10)	(2.49)	(1.33)	(1.29)

Note: M: men; W: women. Civil status, S: single; C: common law couple; M: married; D: divorced; and W: widower.

Finally, *Table 12* exposes the results for the multidimensional decomposition by attribute, and by gender of civil status. Married men and men in common law are the sub-groups which have the biggest contribution to μ_B (46.30% and 13.80% respectively).

5. Conclusion

This article extends the study of multidimensional poverty by introducing a synthetic analysis of decomposition that points out the dominant dimensions (health, education, etc.) and the most urgent target sub-groups (gender, areas, civil status, etc.) of policy interventions.

This approach and the decompositions were applied to study the level of poverty of Argentina in 1998. We have shown that the most affected dimensions of poverty are the social contributions, the level of education of reference person, the professional occupation, and the household equivalent income. Four group decompositions have been implemented in this study: (*i*) by region; (*ii*) by civil status; (*iii*) by gender; and (*iv*) by household size. The results show that the North-east is the poorest region; people in common law couple suffer more of poverty than the other civil status; women are most affected than men; and finally, people who live in houses with 1 or 2 bedrooms are poorer than people who live in bigger houses.

Two sub-group decompositions have been studied: (*i*) by gender of regions; and (*ii*) by gender of civil status. The outcome of this decomposition is that women are more affected by poverty than men in all regions; and for civil status groups, the sub-groups of women are more poor than the sub-groups of men in all cases excepted in the single one.

These results are very useful in order to plan socio-economic policies to reduce poverty diffusion: on the basis of previous results, these policies should be addressed to the reform of labor market specially women's conditions; and educational system for men and women. It is also necessary to improve housing conditions. This policies have to be concentrated in the North-east region, the most affected one. Considering the multi-level decomposition analysis, the biggest contribution to the state of poverty is caused by married men and also by men who live in Great Buenos Aires. These directions will allow the state of poverty in Argentina to be reduced.

6. Bibliography

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APPENDIX I: Degree of membership of the socio-economic attributes studies

A.I.1. Occupancy title and location of the household residence

Occupancy title and location of the household residence	Owner of the house and terrain	Owner of the house only	Rented	Occupied under reddumption agreement	Occupied free of charges
House	0	0.3	0.4	0.5	1
Apartment	0	0.3	0.4	0.5	1
House residence at work	0	0.4	0.5	0.6	1
Rooms for rent	0	0.6	0.6	0.7	1
Hotel	0	0.6	0.75	0.8	1
Not ability household	0.5	0.8	0.9	0.9	1
Run-down neighborhood	0.7	1	1	1	1

A.I.2. Toilets characteristics

Characteristics		Degree of membership	
		There is	There is not
The toilets has	WC with water flow	0	1
	WC without water flow	0.75	1
	Latrines	1	1

A.I.3. Flow characteristics

Characteristics		Degree of membership	
		There is	There is not
The flow goes to	Waste water disposal or sewer	0	1
	Antiseptic room	0.25	1
	Water sump	1	1

A.I.4. Materials of construction of the household (of the principals' walls)

Materials	Degree of membership
Masonry (brick, concrete, and others)	0
Wood	0.25
Metal or fibrocement	0.50
Adobe	0.75
Carton or waste	1
Others	1

A.I.5. Household size: σ = number of households members/number of rooms of the household[9]

Ratio (σ)	Degree of membership
$\sigma \leq 1$	0
$1 < \sigma \leq 2$	0
$2 < \sigma \leq 3$	0.5
$\sigma > 3$	1

[9]We have not considered the bathrooms or the kitchen.

A.I.6. Household equivalent income[10]

Income level (y_i^e)	Degree of membership
If $y_i^e \leq y_{0,15}^e$	1
If $y_{0,15}^e < y_i^e \leq y_{0,60}^e$	$(y_{0,60}^e - y_i^e)/(y_{0,60}^e - y_{0,15}^e)$
If $y_i^e > y_{0,60}^e$	0

A.I.7. Stability of occupation of the reference person[11]

		Degree of membership		
		< 25 years old	**25-65 years old**	**> 65 years old**
Male employed head of household	**Permanent**	0	0	0
	Temporary	0.1	0.1	0
	Unknown	0.2	0.3	0,1
	Little job	0.4	0.5	0,1
Male unemployed head of household		1	1	1
Male inactive		0.5	0.6	0.2
Female employed head of household	**Permanent**	0	0	0
	Temporary	0.1	0.2	0
	Unknown	0.2	0.4	0,1
	Little job	0.4	0.6	0,1
Female unemployed head of household		1	1	1
Female inactive		0.5	0.8	0.2

A.I.8. Higher level of education completed by the reference person

Level of education	Degree of membership
None	1
Primary school	1
National School	0.5
Commercial school	0.5
Normal school	0.5
Technical school	0.25
Others	0.25
Associate' s university degree (3 years of study)	0.1
University studies	0

A.I.9. Professional occupation of the reference person

Occupation	Degree of membership
Manager or employer	0
Self employed	0
Office worker	0.3
Non salary worker	1

[10] Where $y_{0.15}^e$ and $y_{0.60}^e$ are the equivalent income for the 15th and 60th percentile, respectively.

[11] We made an adaptation of the degree of membership proposed by Dagum and Costa (2004) for this attribute.

A.I.10 Pension and others benefits for the employed person[12]

Pensions and others	Degree of membership
Pension only	0.5
Combinations with pension	0.25
Combinations without pension	0.9
All the benefits	0
Without any benefit	1
Employed without salary	1
Unemployed	1

A.I.11 : Ratio: the number of the household members with income and the household size [13]

Number of rooms of the household	Value of the ratio	Degree of membership
1	**0**	1
1	**1**	0
2	**0**	1
2	**≥ 0.5**	0
3	**0**	1
3	**≥ 0.33**	0
4	**0**	1
4	**0.25**	0.4
4	**≥ 0.5**	0
5	**0**	1
5	**0.2**	0.5
5	**≥ 0.4**	0
6	**0**	1
6	**0.16**	0.75
6	**0.33**	0.25
6	**≥ 0.5**	0
≥ 7	**0**	1
≥ 7	**0.14-0.29**	0.75
≥ 7	**0.3-0.58**	0.25
≥ 7	**>0.58**	0

[12] The benefits are: holiday period, worker compensation, pension, social security and dismissal's indemnity.
[13] Degree of membership proposed by Dagum and Costa (2004) for this attribute.

APPENDIX II : Equivalent scales

Table A.II.1.: Values of the equivalent scale used in the present article

Household Size	Equivalent scale
1 person	73
2 persons	82
3 persons	91
4 persons	**100**
5 persons	109
6 persons	118
7 persons or more	127

To transform the level of income of an *N*-size household into its equivalent income as it will be an *N**-size household, we had used the approach to build an equivalence scale proposed by Dagum and Costa (2004). For the application of this method is necessary to calculate a crossed elasticity between the level of income and the size of the household. The data base used for this estimation comes from the expenditure of household survey proposed by the World Bank in 2002.

APPENDIX III: The population in Argentina: regions and their conglomerations

Regions of the country	Total population consider in the survey[14]	Conglomeration	Total population in each conglomeration	Number of household's survey of each region
Cuyo	**1238878 (3.80%)**	**Mendoza**	773113	**3485**
		San Luis	113074	
		San Juan	352691	
GBA	**10913846 (33.44%)**	**Cap Federal**	2965403	**3549**
		Conurbano	7948443	
North-east	**908781 (2.78%)**	**Corrientes**	258103	**3663**
		Posadas	210755	
		Resistencia	292287	
		Formosa	147636	
North-west	**1728831 (5.30%)**	**Stgo. Estero**	261824	**5247**
		Tucuman	652882	
		Salta	368659	
		La Rioja	103727	
		Jujuy	219924	
		Catamarca	121815	
Pampeana	**4660613 (14.28%)**	**Concordia**	116485	**9196**
		Parana	207041	
		Rosario	1117322	
		Santa Fé	396991	
		La Pampa	80592	
		Cordoba	1175400	
		Rio Cuarto	138853	
		B. Blanca	265885	
		La Plata	642979	
		Mar Plata	519065	
Patagonia	**442560 (1.36%)**	**C Rivadavia**	127038	**3471**
		Neuquen	183579	
		Rio Gallegos	64640	
		Trra Fuego	67303	
Total			19893509	**28511**
Total Country		**Argentina**	**32633528**	

Source: INDEC, Base Usuaria Ampliada, May 1998

[14] In brackets we find for each region the per cent number of the total population consider in the survey observations.

APPENDIX IV: Multidimensional decomposition

Tables A.IV.1 and *A.IV.2* present the unidimensional poverty indexes by attribute and by: (*i*) gender; and (*ii*) household size, respectively. These values reflect the degree of deprivation of each attribute for the total population of each group.

Table A.IV.1: Unidimensional poverty index by attribute and by gender

	Attributes										
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
Men	0.1717	0.0209	0.0940	0.0847	0.1859	0.3912	0.6015	0.1884	0.4095	0.6598	0.1452
Women	0.1807	0.0173	0.0559	0.0700	0.1609	0.5082	0.6574	0.3253	0.6796	0.8216	0.1573

Table A.IV.2: Absolute and relative contribution to the MPI by attribute and by gender

	Attributes										
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
Men	**0.0121**	0.0033	0.0094	0.0086	**0.0129**	**0.0136**	**0.0117**	0.0113	**0.0120**	0.0094	0.0111
	(7.37)	(2.01)	(5.72)	(5.24)	**(7.85)**	**(8.28)**	**(7.15)**	(6.90)	**(7.35)**	(5.71)	(6.80)
Women	0.0046	0.0010	0.0020	0.0026	0.0041	0.0064	0.0047	0.0071	0.0073	0.0043	0.0044
	(2.83)	(0.61)	(1.24)	(1.58)	(2.48)	(3.93)	(2.85)	(4.35)	(4.45)	(2.60)	(2.69)

Tables A.IV.3 and *A.IV.4* expose the absolute and relative contributions to the multidimensional poverty index by attribute and by: (*i*) gender; and (*ii*) household size, respectively.

Table A.IV.3: Unidimensional poverty index by attribute and by household size

	Attributes										
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
1-2	0.2853	0.0345	0.1904	0.1395	0.2168	0.5503	0.6913	0.2451	0.4955	0.7227	0.0870
3-4	0.1188	0.0120	0.0274	0.0526	0.1677	0.3663	0.6008	0.2156	0.4845	0.6895	0.1574
5-6	0.0648	0.0104	0.0033	0.0200	0.1054	0.2492	0.4287	0.1988	0.4088	0.7001	0.2901
7 or +	0.0806	0.0082	0.0003	0.0078	0.0527	0.2721	0.2901	0.2276	0.4054	0.7605	0.6602

Table A.IV.4: Absolute and relative contribution to the MPI by attribute and by household size

	Attributes										
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
1-2	**0.0098**	0.0027	**0.0093**	0.0069	0.0074	**0.0094**	0.0066	0.0072	0.0071	0.0050	0.0033
	(6.01)	(1.63)	**(5.69)**	(4.23)	(4.49)	**(5.71)**	(4.03)	(4.40)	(4.36)	(3.07)	(2.00)
3-4	0.0063	0.0014	0.0021	0.0040	**0.0088**	**0.0096**	**0.0088**	**0.0098**	**0.0107**	0.0074	**0.0091**
	(3.85)	(0.87)	(1.26)	(2.45)	**(5.35)**	**(5.85)**	**(5.39)**	**(5.96)**	**(6.56)**	(4.50)	**(5.57)**
5-6	0.0005	0.0002	0.0000	0.0002	0.0007	0.0009	0.0009	0.0012	0.0012	0.0010	0.0023
	(0.28)	(0.10)	(0.02)	(0.13)	(0.46)	(0.54)	(0.52)	(0.75)	(0.75)	(0.62)	(1.39)
7 or +	0.0001	0.0000	0.0000	0.0000	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0009
	(0.06)	(0.01)	(0.00)	(0.00)	(0.04)	(0.10)	(0.06)	(0.14)	(0.13)	(0.11)	(0.54)

APPENDIX V: Multi-level and multidimensional decompositions

Tables A.V.1 and *A.V.4* show the multi-level decomposition by: (*i*) household size and region; and (*ii*) years old and gender, respectively.

Table A.V.1: MPI by household size of regions, their absolute and relative contribution to μ_B and the relative contributions to the k-th group of the b-th sub-group

Groups: Regions	Sub-groups: Household size	μ_B^{kb}	Relative contribution to the *k*-th group of the *b*-th sub-group	Absolute contribution to μ_B of the *b*-th sub-group	Relative contribution to μ_B of the *b*-th sub-group
Cuyo	**1 – 2 - 3**	0.2009	**67.17**	0.0071	4.32
	4 - 5 – 6	0.1448	31.72	0.0033	2.04
	7 or more	**0.2110**	1.11	0.0001	0.07
GBA	**1 – 2 - 3**	**0.1674**	**79.60**	0.0708	**43.19**
	4 - 5 – 6	0.1299	19.40	0.0172	**10.53**
	7 or more	0.1432	1.00	0.0009	0.54
North-east	**1 – 2 - 3**	**0.1980**	**74.38**	0.0056	3.43
	4 - 5 – 6	0.1382	23.82	0.0018	1.10
	7 or more	0.1807	1.80	0.0001	0.08
North-west	**1 – 2 - 3**	**0.1972**	**69.46**	0.0092	5.59
	4 - 5 – 6	0.1347	28.56	0.0038	2.30
	7 or more	0.1565	1.98	0.0003	0.16
Pampeana	**1 – 2 - 3**	**0.1798**	**79.88**	0.0321	**19.58**
	4 - 5 – 6	0.1376	18.81	0.0076	4.61
	7 or more	0.1571	1.31	0.0005	0.32
Patagonia	**1 – 2 - 3**	0.1535	**75.29**	0.0026	1.61
	4 - 5 – 6	0.1113	23.49	0.0008	0.50
	7 or more	**0.2206**	1.22	0.0000	0.03
Total		**0.1638**		**0.1638**	**100%**

Table A.V.2: UPI by attribute and by household size of each region

		Attributes										
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
1	**I**	0.2941	0.1555	0.1515	0.0424	0.1591	0.5501	0.6707	0.2026	0.4427	0.7277	0.0522
	II	0.1126	0.0860	0.0081	0.0066	0.1283	0.3192	0.5549	0.2050	0.4563	0.7036	0.2172
	III	0.2111	0.1334	0.0000	0.0000	0.0821	0.3499	0.4023	0.2248	0.5241	0.8205	0.6845
2	**I**	0.1846	0.0123	0.0863	0.1056	0.2175	0.4250	0.6630	0.2291	0.4912	0.6895	0.1012
	II	0.0735	0.0020	0.0099	0.0394	0.1480	0.2551	0.4902	0.2072	0.4379	0.6984	0.2720
	III	0.0472	0.0000	0.0000	0.0000	0.0252	0.2457	0.2232	0.2674	0.3856	0.7698	0.6345
3	**I**	0.2606	0.0390	0.1898	0.1426	0.1269	0.6378	0.6734	0.2163	0.4664	0.7076	0.0840
	II	0.0939	0.0074	0.0216	0.0384	0.1271	0.4268	0.5755	0.1904	0.4515	0.6532	0.2431
	III	0.2056	0.0000	0.0058	0.0381	0.1213	0.4064	0.2324	0.1715	0.4653	0.6512	0.6940
4	**I**	0.2427	0.0261	0.2206	0.1516	0.1403	0.5829	0.6743	0.2396	0.4632	0.7377	0.0576
	II	0.0987	0.0040	0.0186	0.0336	0.0828	0.3367	0.5551	0.2493	0.5348	0.7291	0.2170
	III	0.0745	0.0000	0.0000	0.0090	0.0699	0.2379	0.4410	0.2239	0.4837	0.7794	0.6271
5	**I**	0.2236	0.0159	0.1207	0.0801	0.1970	0.5138	0.6476	0.2427	0.5243	0.7383	0.1154
	II	0.0896	0.0025	0.0049	0.0211	0.1406	0.3586	0.4910	0.2065	0.4643	0.6909	0.3121
	III	0.0851	0.0029	0.0000	0.0118	0.0716	0.2937	0.3268	0.1672	0.3656	0.7524	0.7100
6	**I**	0.2440	0.0703	0.1304	0.0674	0.0726	0.3335	0.6383	0.1964	0.4200	0.5939	0.0363
	II	0.0954	0.0284	0.0072	0.0089	0.0287	0.2166	0.5695	0.1710	0.3986	0.5968	0.2310
	III	0.2549	0.1065	0.0000	0.0789	0.1071	0.2856	0.3910	0.2680	0.4774	0.6966	0.7035

Note: 1: Cuyo; 2:GBA; 3: North-east; 4: North-west; 5: Pampeana; and 6: Patagonia. I: 1, 2 or 3 bedrooms; II: 4, 5 or 6 bedrooms; and III: 7 or more bedrooms.

Tables A.V.2 and *A.V.5,* present the unidimensional poverty indexes by: (*i*) household size and region; and (*ii*) years old and gender, respectively.

Table A.V.3: Absolute and relative contributions to μ_B by attribute and by household size of each region

		Attributes										
		X_1	**X_2**	**X_3**	**X_4**	**X_5**	**X_6**	**X_7**	**X_8**	**X_9**	**X_{10}**	**X_{11}**
1	**I**	0.0010	0.0012	0.0007	0.0002	0.0005	0.0009	0.0006	0.0006	0.0006	0.0005	0.0002
		(0.61)	(0.72)	(0.44)	(0.13)	(0.32)	(0.56)	(0.38)	(0.36)	(0.38)	(0.30)	(0.12)
	II	0.0002	0.0004	0.0000	0.0000	0.0003	0.0003	0.0003	0.0004	0.0004	0.0003	0.0005
		(0.15)	(0.26)	(0.02)	(0.01)	(0.17)	(0.21)	(0.21)	(0.24)	(0.26)	(0.19)	(0.32)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)
2	**I**	**0.0075**	0.0011	0.0050	**0.0062**	**0.0087**	**0.0085**	**0.0074**	**0.0079**	**0.0083**	**0.0056**	**0.0045**
		(4.57)	(0.68)	(3.03)	**(3.76)**	**(5.30)**	**(5.19)**	**(4.55)**	**(4.84)**	**(5.08)**	**(3.44)**	**(2.74)**
	II	0.0009	0.0001	0.0002	0.0007	0.0019	0.0016	0.0017	0.0023	0.0023	0.0018	0.0038
		(0.57)	(0.04)	(0.11)	(0.44)	(1.13)	(0.98)	(1.06)	(1.38)	(1.42)	(1.09)	(2.31)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0001	0.0004
		(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.04)	(0.02)	(0.08)	(0.06)	(0.06)	(0.25)
3	**I**	0.0007	0.0002	0.0007	0.0006	0.0003	0.0009	0.0005	0.0005	0.0005	0.0004	0.0003
		(0.43)	(0.15)	(0.45)	(0.34)	(0.21)	(0.52)	(0.31)	(0.31)	(0.32)	(0.24)	(0.15)
	II	0.0001	0.0000	0.0000	0.0001	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003
		(0.07)	(0.01)	(0.02)	(0.04)	(0.10)	(0.16)	(0.12)	(0.12)	(0.14)	(0.10)	(0.20)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.03)
4	**I**	0.0011	0.0003	0.0014	0.0010	0.0006	0.0013	0.0008	0.0009	0.0009	0.0007	0.0003
		(0.66)	(0.16)	(0.85)	(0.59)	(0.38)	(0.78)	(0.51)	(0.56)	(0.53)	(0.40)	(0.17)
	II	0.0003	0.0000	0.0001	0.0001	0.0002	0.0004	0.0004	0.0006	0.0006	0.0004	0.0006
		(0.16)	(0.01)	(0.04)	(0.08)	(0.13)	(0.27)	(0.25)	(0.35)	(0.37)	(0.24)	(0.39)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
		(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.07)
5	**I**	0.0038	0.0006	0.0029	0.0020	0.0033	**0.0043**	0.0031	0.0035	0.0038	0.0025	0.0022
		(2.34)	(0.37)	(1.79)	(1.21)	(2.03)	**(2.65)**	(1.87)	(2.17)	(2.29)	(1.56)	(1.32)
	II	0.0005	0.0000	0.0000	0.0002	0.0007	0.0009	0.0007	0.0009	0.0010	0.0007	0.0018
		(0.29)	(0.02)	(0.02)	(0.10)	(0.44)	(0.57)	(0.44)	(0.57)	(0.62)	(0.45)	(1.10)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
		(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.15)
6	**I**	0.0004	0.0003	0.0003	0.0002	0.0001	0.0003	0.0003	0.0003	0.0003	0.0002	0.0001
		(0.25)	(0.16)	(0.19)	(0.10)	(0.07)	(0.17)	(0.18)	(0.17)	(0.18)	(0.12)	(0.04)
	II	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
		(0.04)	(0.03)	(0.00)	(0.01)	(0.01)	(0.05)	(0.07)	(0.06)	(0.07)	(0.05)	(0.11)
	III	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)

Note : 1: Cuyo; 2:GBA; 3: North-east; 4: North-west; 5: Pampeana; and 6: Patagonia. I: 1, 2 or 3 bedrooms; II: 4, 5 or 6 bedrooms; and III: 7 or more bedrooms.

Finally, *Tables A.V.3* and *A.V.6* expose the relative and absolute contributions to the global multidimensional poverty index by: (*i*) household size and region; and (*ii*) years old and gender, respectively.

Table A.V.4: MPI by years old of gender, their absolute and relative contributions to μ_B and the relative contribution to the k-th group of the b-th sub-group

Groups: Gender	Sub-groups: Years old	μ_B^{kb}	Relative contribution to the *k*-th group of the *b*-th sub-group	Absolute contribution to μ_B of the *b*-th sub-group	Relative contribution to μ_B of the *b*-th sub-group
Men	**< 25**	**0.2017**	5.04	0.0058	3.55
	25 – 45	0.1593	**44.17**	0.0509	**31.09**
	46 – 65	0.1451	33.75	0.0389	**23.75**
	> 65	0.1698	17.05	0.0197	12.00
Women	**< 25**	**0.1849**	4.39	0.0021	1.30
	25 – 45	0.1819	25.92	0.0126	7.68
	46 – 65	0.1827	**36.09**	0.0175	**10.69**
	> 65	0.1792	33.59	0.0163	9.95
Total		**0.1638**		**0.1638**	**100%**

Table A.V.5: UPI by attribute and by age of gender

		Attributes										
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
M	**A**	0.4311	0.0315	0.1509	0.1396	0.2078	0.4797	0.4703	0.2000	0.4496	0.6930	0.1051
	B	0.2378	0.0264	0.1497	0.1086	0.2107	0.3818	0.5262	0.1101	0.2726	0.5381	0.1244
	C	0.1023	0.0146	0.0555	0.0684	0.1741	0.3571	0.6394	0.2129	0.3826	0.6673	0.1822
	D	0.0856	0.0174	0.0152	0.0430	0.1395	0.4739	0.7548	0.3454	0.8399	0.9706	0.1272
W	**A**	0.3903	0.0212	0.0624	0.0483	0.0963	0.4504	0.2396	0.3684	0.7439	0.9010	0.1280
	B	0.2786	0.0218	0.1297	0.1071	0.1875	0.4719	0.4792	0.2644	0.4229	0.6428	0.1352
	C	0.1375	0.0188	0.0462	0.0771	0.1784	0.4569	0.6688	0.4336	0.6075	0.7764	0.1653
	D	0.1252	0.0119	0.0093	0.0370	0.1302	0.5970	0.8339	0.2521	0.9425	0.9950	0.1695

Note: A: < 25 years old; B: between 25 and 45 years old; C: between 46 and 65 years old; and D > 65 years old.

Table A.V.6: Absolute and relative contributions to μ_B by attribute and by age of each region

		Attributes										
		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
M	**A**	0.0012	0.0002	0.0006	0.0006	0.0006	0.0007	0.0004	0.0005	0.0005	0.0004	0.0003
		(0.73)	(0.12)	(0.36)	(0.34)	(0.35)	(0.40)	(0.22)	(0.29)	(0.32)	(0.24)	(0.19)
	B	**0.0073**	0.0018	**0.0065**	**0.0048**	**0.0064**	**0.0058**	0.0045	0.0029	0.0035	0.0033	0.0042
		(4.46)	(1.11)	**(3.98)**	**(2.93)**	**(3.88)**	**(3.53)**	(2.73)	(1.76)	(2.13)	(2.03)	(2.54)
	C	0.0026	0.0008	0.0020	0.0025	0.0044	0.0045	**0.0046**	**0.0047**	0.0041	0.0035	0.0051
		(1.61)	(0.51)	(1.24)	(1.55)	(2.69)	(2.77)	**(2.78)**	**(2.85)**	(2.51)	(2.11)	(3.13)
	D	0.0010	0.0004	0.0002	0.0007	0.0015	0.0026	0.0023	0.0033	0.0039	0.0022	0.0015
		(0.58)	(0.27)	(0.15)	(0.42)	(0.93)	(1.59)	(1.42)	(2.00)	(2.38)	(1.33)	(0.94)
W	**A**	0.0004	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0003	0.0003	0.0002	0.0002
		(0.26)	(0.03)	(0.06)	(0.05)	(0.06)	(0.15)	(0.04)	(0.21)	(0.21)	(0.12)	(0.09)
	B	0.0018	0.0003	0.0012	0.0010	0.0012	0.0015	0.0009	0.0015	0.0012	0.0009	0.0010
		(1.13)	(0.20)	(0.75)	(0.62)	(0.75)	(0.94)	(0.54)	(0.91)	(0.72)	(0.52)	(0.60)
	C	0.0013	0.0004	0.0006	0.0010	0.0016	0.0021	0.0017	0.0034	0.0023	0.0014	0.0017
		(0.77)	(0.24)	(0.37)	(0.62)	(0.99)	(1.27)	(1.04)	(2.08)	(1.43)	(0.88)	(1.01)
	D	0.0011	0.0002	0.0001	0.0005	0.0011	0.0026	0.0020	0.0019	0.0034	0.0018	0.0016
		(0.67)	(0.14)	(0.07)	(0.28)	(0.68)	(1.57)	(1.23)	(1.15)	(2.10)	(1.07)	(0.99)

Note: M: men; W: women. A: < 25 years old; B: between 25 and 45 years old; C: between 46 and 65 years old; and D > 65 years old.